

**“MACHINE FOR MAKING OXIDATION HAIR DYES IN PARTICULAR
FOR HAIRDRESSERS”**

Background of the invention

The present invention relates to a machine for preparing hair dyes, of an oxidation type, in particular for hairdressers.

As is conventionally known, different colors or “nuances” of oxidating hair dyes are basically made, according to colorimetry technique laws, by combining the three primary colors blue, red and yellow, which are obtained from color precursor molecules, the so-called “intermediate” precursor molecules, said colors being herein obtained by adding an oxidating liquid.

However, for allowing the hairdresser to easily make a given hair dye, he/she must not randomly mix the individual primary colors by adding at will the oxidating liquid, but must use a color range, i.e. already prepared oxidating hair dyes, as typically supplied by the hair dye makers; then, he/she must add the oxidating liquid according to a ratio preset by the hair dye maker, for example: 1 part of the chosen hair dye + 1 part of the oxidating liquid, or 1 part of the hair dye + 1.5 parts of the oxidating liquid and so on. To meet very different requirements of a lot of different colors or nuances as desired by a customer, accordingly, the mentioned hair dye ranges or arrays comprise a plurality of colors, for example 50 colors, each is supplied in a

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dedicated crushable aluminium vessel or tube of about 60-100 ml.

On the other hand, available oxidating liquids are made in a limited number of different oxygen volumes, such as 10, 20, 30 and 40 oxygen volumes, and are conventionally supplied in 1 liter vessels, a 40 volume number constituting the maximum commercial concentration of the oxidating liquids.

Since, with respect to the hair dye colors, a hairdressers usually holds in store at least two flexible vessels or tubes for each color, it should be apparent that he/she would have more than 100 color vessels and, moreover, from 6 to 15 oxidating liquid vessels, of a 1 liter volume, depending on the contents of the hair dye vessels and on the hair dye and oxidating liquid mixing ratio.

Thus, such a requirement, practically involves a lot of drawbacks and disadvantages, the most important of which are hereinbelow listed:

- Such a comparatively high number of vessels requires dedicated holding cabinets, for a good and easy exhibition/availability of the 100 and over vessels, which cabinets have a large size and, accordingly, require a large space for their installation and allowing the hairdressers to move therethrough, which is not always available and, moreover, involves a consequent high cost.
- Since it is not possible to fully withdraw the colors contained in said crushable vessels, this constitutes an inevitable economic loss.
- Moreover, the individual color and oxidating liquid vessels require a dedicated individual packaging and associated use data sheet, thereby further increasing the overall cost of the product, and involving disposal of problems related to the disposal of said vessels, paper sheets and packaging material.

- The number of colors/hair dyes which can be made is limited due to a limited number of the colors of the individual color ranges or dye arrays.
- The color variations, made by mixing the hair dye with the oxidating liquid, are manually obtained by the hairdresser, i.e. in an empirical manner, thereby it is not possible to safely reproduce them, as it is frequently required by the hairdresser customers always choosing the same colors for a given period of time.

Summary of the invention

Accordingly, the aim of the present invention is to provide a machine for making hair dyes, of an oxidation type, in particular for hairdressers, designed for overcoming the prior drawbacks and disadvantages, and allowing to make in an easy repeating manner a very high number of hair dyes, as well as broaden said hair dye number by providing new hair dyes susceptible to be sequentially stored in memory means of said machine.

Within the scope of the above mentioned aim, a main object of the present invention is the provision of a very reduced number of products, which can be easily stored, with the related delivery means, in the machine for making oxidation hair dyes of a very reduced size.

Yet another object of the present invention is to slave the control of said delivery means to an hardware/software system including a related managing program for managing the hair dye formulations in a "preset automatic" manner, i.e. adapted to provide preset hair dyes, as well as in an "automatic mating" manner, i.e. allowing to specifically choose the color nuance from the stored ones, and the oxidating liquid type to be used.

Yet another object of the present invention is to provide the possibility of changing in a substantially continuous manner the hair dye colors, by providing an oxidating liquid which can be used with a volume number to be set at will, in a practically continuous manner, from 1 to the available volume maximum number, which, at present, corresponds, for commercial products, to a volume number of 40, the primary colors being adapted to be mixed with a practically theoretically unlimited number of proportions.

According to one aspect of the present invention, the above mentioned aim and objects are achieved by a machine, and related control system, and software/hardware means for making hair oxidation dyes, for hairdressers, having the features of claim 1.

Further developments and improvements of the machine and related control system according to the present invention are defined in the dependent claims.

The machine and related control system for making hair dyes according to the present invention provides a lot of important advantages, such as:

- ~~The possibility of using, instead of the over 100 hair dye and oxidating liquid vessels which are conventionally used by hairdressers, only 6 product vessels, to provide a comparatively high number of hair dyes/nuances for example 200 or more, with a consequent~~
- great reduction of the packaging and disposal of cost of the vessels and corresponding packaging materials.
- Owing to the small number of vessels and their large volumes, which, according to the invention, correspond for example to 3 liters, it is possible, to overcome the need of making and disposing of corresponding prior products of:
200 tubes of 60 ml; 200 paperboard casings; 200 plastic plugs

for the aluminium tubes; 200 data sheet papers; 12 1 liter PVC bottles; and 12 PVC bottle plugs, considering the above indicated mixing ratio of 1:1.

- The elimination of the space and cabinets necessary for the above mentioned over 100 hair dye and oxidating liquid vessels as conventionally used by hairdressers.
- A drastic reduction of the supplied store.
- An exhaustive use of the products, i.e. without any waste thereof.
- The possibility of making time repeatable hair dye colors and nuances, with a very high accuracy, and which can be repeated at different places, for example by machines installed at Rome, Paris and New York and so on, thereby the end result will be independent on the hairdresser skillness, since all the required hair dyes or primary color and oxidating liquid mixture formulations are preliminarily stored in the machine and accordingly will be available in a time repeatable manner.
- The possibility of providing new intensities of the stored nuances or colors, by allowing the hairdresser to change the volume number of the used oxidating liquid.
- The possibility of centrally managing, by a managing company, a network of the inventive machines, at the hairdresser shops.
- The possibility of storing novel hair dyes, made by or for the company managing the machine net distributed through hairdresser shops and which can be transferred to said hairdresser machines.
- A greater flexibility in mating the hair dye colors or nuances to the natural colors of the individual customers.
- A reduction of the hair dye machine time.
- The possibility of supplying the customers with a personal magnetic card for storing thereon the customer nuances, which could be repeated in an identical manner at any hairdresser shop

including at least a machine according to the invention.

- The possibility, without departing from the trichological field, of replacing the individual products suitable for oxidation hair dyes with other products to be mixed for providing hair dyes of different nature, such as the so-called "direct or semipermanent" hair dyes, which directly color hair without requiring any oxidation process, i.e. oxidating liquids, and likewise have a formulation which is strictly related to the colorimetry laws. Accordingly, the teachings of the present invention can also be used for making and supplying other hair dyes, or cosmetic products, in which case the related software and machine arrangement would be correspondingly changed.

Brief description of the drawings

Further characteristics, advantages and details of the machine and related software/hardware system for making hair dyes, in particular for hairdressers, according to the present invention will become more apparent hereinafter from the following disclosure related to an embodiment of the invention which is illustrated in the accompanying drawings, where:

Figure 1 is a perspective view of the machine for making hair dyes according to the present invention;

Figure 2 is a further perspective view of the inside top portion of the machine, for illustrating the arrangement therein of the used concentrated product vessels;

Figure 3 shows the bottom portion of the machine holding therein the delivery means for finely metering the provided products; and

Figure 4 shows a principle arrangement of the control system of the inventive machine.

Description of the preferred embodiment

According to the present invention, is herein submitted the concept of replacing prior limited pluralities of hair colors or dyes, available in related flexible vessels or tubes (in a number of about 50) to be mixed with a likewise limited number of oxidating liquids having a fixed volume number of 10, 20, 30 and 40 volumes, with a limited number or starting components or products stored in a dedicated large volume vessels, herein indicated by the reference numbers 1 to 6, which can be mixed according to preset formulations which are stored, in a repeatable manner, in the software of the inventive machine as it will be disclosed hereinafter.

In the following disclosure, for allowing one skilled in the art to easily understand the invention, with the reference numbers of each vessel will be also indicated the product held therein. According to the invention, the following vessels are herein provided:

- a vessel 1: for the highly concentrated primary color blue,
- a vessel 2: for the highly concentrated primary color yellow;
- a vessel 3: for the highly concentrated primary color red,
- a vessel 4: for a uncolored neutral base, for thinning the primary color,
- a vessel 5: for a high volume number oxidating liquid, for example of a 40 volume number, containing hydrogen peroxide,
- a vessel 6: for a neutral base, without hydrogen peroxide, for thinning the oxidating liquid.

In this connection it should be pointed out that the uncolored neutral base 4 for thinning the primary colors is used to make less clear/intense given reflex obtained by a set ratio of the individual primary colors and that, by using the neutral base 6, without hydrogen peroxide, i.e. at 0 volumes, to thin the 40 volume oxidating liquid 5, it is possible to make an oxidating

liquid having a volume number which can be practically selected at will, in a substantially continuous manner, from 1 to 39 volumes.

According to the invention, the primary colors have been specifically formulated in a very concentrated manner for the inventive machine, which has been generally indicated by the reference number 8. Thus, by replacing the proposed primary colors with other commercially available primary colors, i.e. having a different concentration, it would not be possible to make hair dyes having the same nuances or shadings made by using the colors according to the invention.

In actual practice, the vessels 1 to 6 have a large storing capability of volume, for example of 1-3 liters or more. For allowing said vessels 1 to 6 to be easily handled, they can be advantageously made as flexible synthetic material bags, for example of polyethylene, with a slotted top handle 9 for easily removably hanging them on hook elements 10 supported on a top supporting disc 11 fixed to a double-gate 13, 14 frame 17, enclosed by the casing 16 of the machine 8.

For safely preventing possible contacts between the product and air, which would spoil the product chemical characteristic, and consequently the mixing results, said vessels 1-6 are provided in the form of disposable or single use vessels, and comprise, at the bottom thereof, a flexible tube 17 which can be coupled to a high precision delivery means 18, such as a pump-motor unit 19 and associated valve assembly 20. The outlets, not shown, of said delivery means 18 lead, one adjacent the other, to the ceiling of a cavity 21 of the machine 8, in which a vessel 22 can be respectively arranged for receiving therein the hair dye forming products or components, as prepared, in a ready for use form, as it will be disclosed hereinafter.

Since the individual product circuits are independent

from one another, it is possible to eliminate any problems related to the product mixing and related washing requirements after having made each hair dye, as it would occur, for example, by using a shared delivery manifold tube.

In figures 2 and 3, the reference number 24 indicates an intermediate supporting disc whereas the reference number 25 indicates a disc for supporting the delivery means 18.

The control of the delivery means is performed digitally by a software/hardware system made and operating as it will be disclosed thereafter.

In figure 4, the reference number 26 indicates a PC, 27 an alphanumeric keyboard, 28 a microcontroller, 29 a RS-232 said components being functionally connected to one another and with a managing program including specific algorithms and taking customer aesthetic parameters (such as the hair natural color, eye and skin and flesh color, hair type, solar or lunar typology, physiognomy and so on) forming the software/hardware system of the machine 8.

The operation of the machine can be an "automatic preset" mode of operation as well as an "automatic mating" mode of operation, as it will be disclosed in a more detailed manner hereinafter.

Automatic preset mode of operation

In such an operation mode, the hairdresser accesses the nuances or hair dyes as already established and stored in the software, thereamong he/she can choose that which is most suitable for the customer.

Actually, the hairdresser, after having seen the customer personal colors, hairstyle or haircut, as well as the general aspect, hair length and possible white hairs, and after having chosen with the customer the desired hair dye and

related intensity, hot or cold type of reflex, submits the most suitable hair dye, which can be advantageously seen by the customer for example on a paper medium or directly on the PC screen. Then, the hairdresser must key on the alphanumeric keyboard 27 of the computer 26 the data of a "starting point", formed by some data related to the customer hair as he/she arrives at the hairdresser shop: the hair length, white hair rate, reflex intensity and type (either hot or cold). Moreover, he/she must key data related to an "arrival point", formed by the finishing color tone and reflex desired by the customer. The system, by using dedicated algorithms, will thus be able of interpreting and processing the mentioned data so as to automatically select, set and deliver the required stored nuance. Accordingly, in the hair dye supplied to the vessel 22, will also be included the oxidating liquid, at the set volume number, thereby the delivered hair dye will be supplied in a ready condition to be mixed by a brush for application to the custom head.

As the customer desires a hair dye different from the already stored ones, the hairdresser will switch to the "automatic mating" mode of operation.

Automatic mating mode of operation

With respect to the "automatic preset" mode of operation, the hairdresser can now access the available nuance or hair dye menu, in which said available nuances or hair dyes are offered with the possibility of changing the oxidating liquid volume number from the minimum to the maximum provided values, i.e. from 0 to 40 volumes. In actual practice, the hairdresser can freely choose both the nuance - among all the software defined and stored nuances - as well as the volume number of the oxidating liquid to be used. Accordingly, in this "automatic mating" mode of operation, the most suitable

starting nuance and oxidating liquid volume to be used depending on the customer hair characteristics and end result to be obtained, such as end clearness or intensity of said nuance are directly established by the hairdresser.

In each case the hairdresser cannot affect the establishing of the primary color rates and thus provides nuances extra-novo. He/she can only choose from the plurality of the hair dyes or nuances stored in the software system and "mate or fit" them to the customers by changing the oxidating liquid volume number, but cannot provide novel hair dyes or nuances per se.

By both the disclosed "automatic preset" or "automatic mating" modes of operation, it is not necessary for the hairdresser to precisely know the individual proportions of several components or "recipes" of the hair dyes stored in the program of the machine.

According to an important aspect of the present invention, formulations of new hair dyes can be made in a laboratory, for example according to novel fashion criteria, and said novel formulations can be easily integrated, for example through a modem, into the stores of the already installed machines, thereby said novel hair dyes can be provided, in a very short time, simultaneously to all the hairdressers using the inventive machines.

To assure the required supply continuity of the individual components 1-6 without storing problems, according to a further aspect of the present invention, the machine comprises a modem for automatically ordering new components or vessels 1-6, for example to the Company managing the hairdresser machine network.

From the above constructional and operational disclosure of the machine or related control system for

preparing hair dyes according to the invention, it should be apparent that the teachings of the present invention fully achieve the indicated aim and objects as well as the mentioned advantages.

In actual practice, those skilled in the art can bring to the invention modifications and variations, for example with respect to the control software, or by providing other means for delivering the individual components 1-6, and so on, without departing from the scope of the invention.

Moreover, though in the above disclosure reference has been made to 6 basic components, it would be possible, within the scope of the invention, to optionally associate with said components yet other components designed for affecting the hair dye color and/or providing to said hair dye hair processing properties, such as for supplying hair curative and nourishing components, or components providing hair with setting and stability properties and so on, without departing from the scope of the invention.

Moreover, those skilled in the art can also replace or modify the illustrated control software/hardware system by other suitable systems, i.e. components or programs, operatively equivalent, without departing from the scope of the invention. Furthermore, the scope of the invention further encompasses therein variations of the disclosed software/hardware system designed for specifically formulating and delivering specific trichologic or cosmetic mixtures, such as shampoos, "semipermanent or direct" hair dyes and the like, with a corresponding configuration of the machine and related software/hardware system according to the teachings of the present invention as shown and illustrated and as hereinbelow claimed.

Claims

1. A machine for making oxidation hair dyes, in particular for hairdressers, **characterized** in that said machine comprises:

a) a reduced number of basic components housed in a component housing and, more specifically:

a vessel for the primary color blue,

a vessel for the primary color yellow,

a vessel for the primary color red and a reduced number of thinning and oxidating components, such as

an uncolored neutral base vessel for thinning said primary colors,

a vessel for a high volume number oxidating liquid, for example a 40 volume oxidating liquid, containing hydrogen peroxide, and

a vessel for a neutral base, without hydrogen peroxide, for thinning the oxidating liquid, and

b) delivery means for delivering, in a finely metered manner, the components indicated at a) and

c) digital control means for controlling said delivery means and operatively cooperating with a managing software/hardware system comprising a lot of hair dyes/nuances formulations, as preliminarily tested and stored, which can be partially modified.

2. A machine according to Claim 1, **characterized** in that said primary colors are provided in a high concentration.

3. A machine according to Claim 1, **characterized** in that said vessels for said components of a) have a large volume, for example of 1-3 liters or more.

4. A machine according to Claim 1, **characterized** in that said vessels for said components of a) are made as disposable bags, for example made of a flexible plastic material, having at a top portion thereof a handle element for hanging

inside said machine and, at the bottom thereof, a flexible duct coupled to associated delivery means, said delivery means having an outlet leading to a delivery region of said components in said machine, in turn leading above a receiving region for housing therein a vessel for collecting the hair dye as delivered and in a ready for use condition.

5. A machine according to Claim 1, characterized in that said delivery means of each said component comprise an electric pump-motor unit with an associated valve assembly.

6. A machine according to Claim 1, characterized in that said delivery means are controlled by said managing software/hardware system comprising a microcontroller, storing therein a firmware, said microcontroller communicating, through RS-232 means, with a PC, including a dedicated software program, and an alphanumeric keyboard or the like for selecting a set air dye.

7. A machine according to Claim 1, characterized in that said is adapted to operate in

- an "automatic preset" mode of operation, in which a hairdresser set at first, through said keyboard, a "starting point", i.e. data related to a customer hair, such as a hair length, a white hair rate, a reflex intensity and type (either hot or cold), and secondly an "arrival point", i.e. a tone and reflex of an end desired color, thereby delivering an already tested hair dye as stored in said machine software and
- "an automatic mating" mode of operation in which said hair dyes, as stored in said machine software, can be mated to said customer, by allowing the hairdresser to select said oxidating liquid volume number.

8. A machine according to Claim 1, characterized in that said PC or the like, is built-in in said machine or is installed separately from said machine.

9. A machine according to Claim 1, **characterized** in that said machine comprises a modem for automatically ordering new individual component vessel before exhausting said vessels in said machine.

10. A hair dye, **characterized** in that said hair dye is made by a machine and related control system according to one or more of the preceding claims, and is provided in a ready for use form or is packaged for a delayed use.

11. A machine according to one or more of the preceding claims, **characterized** in that said machine is designed with and comprises a software/hardware control system for making trichologic or cosmetic mixtures, such as semipermanent or direct hair dyes, shampoos and the like.

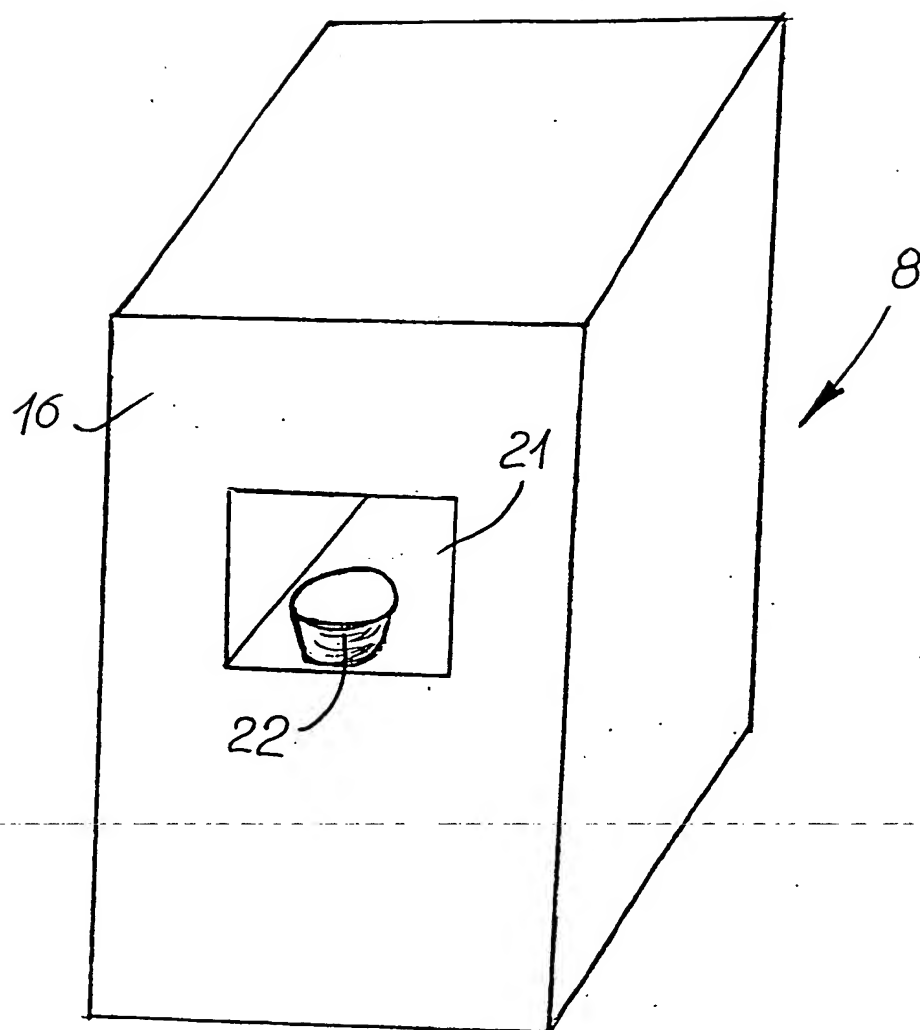


Fig. 1

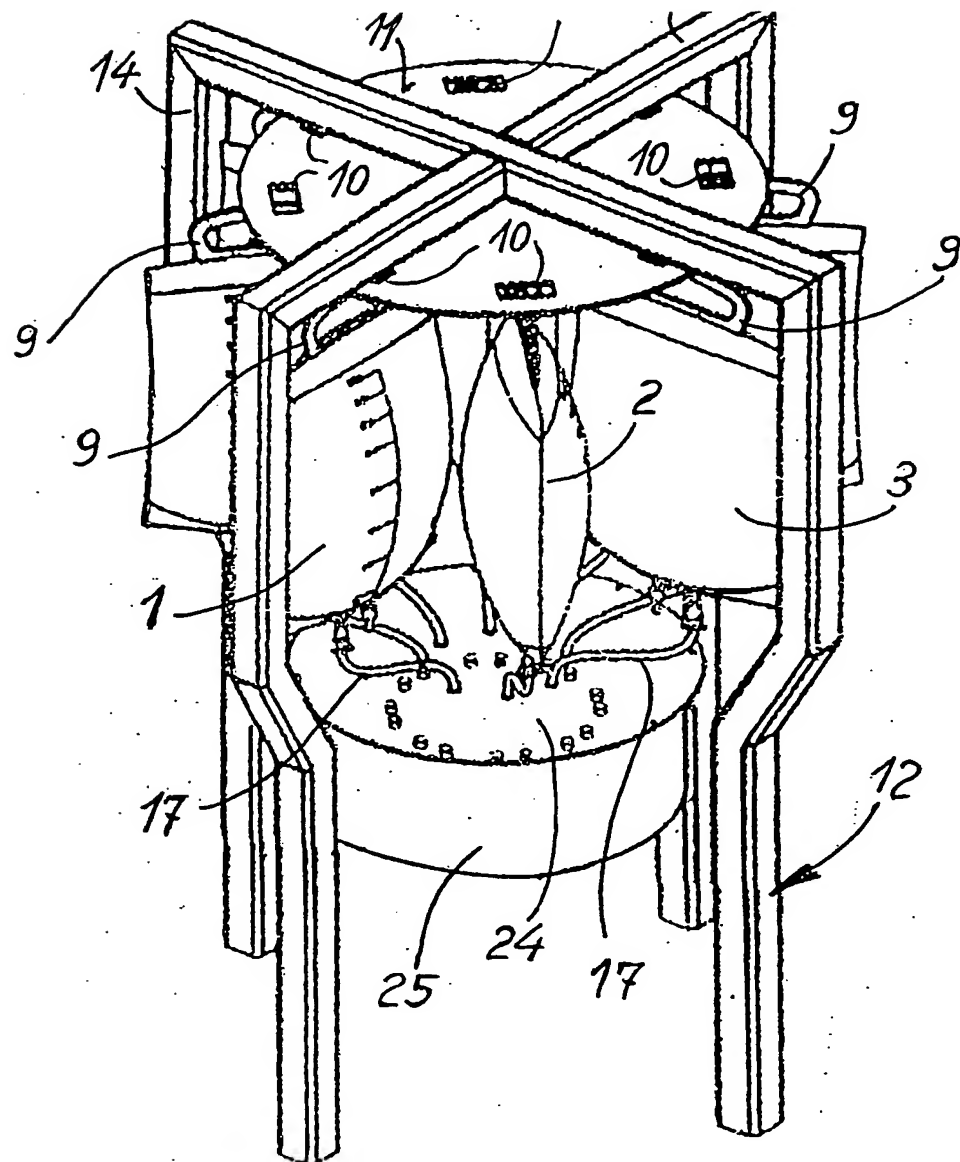


Fig. 2

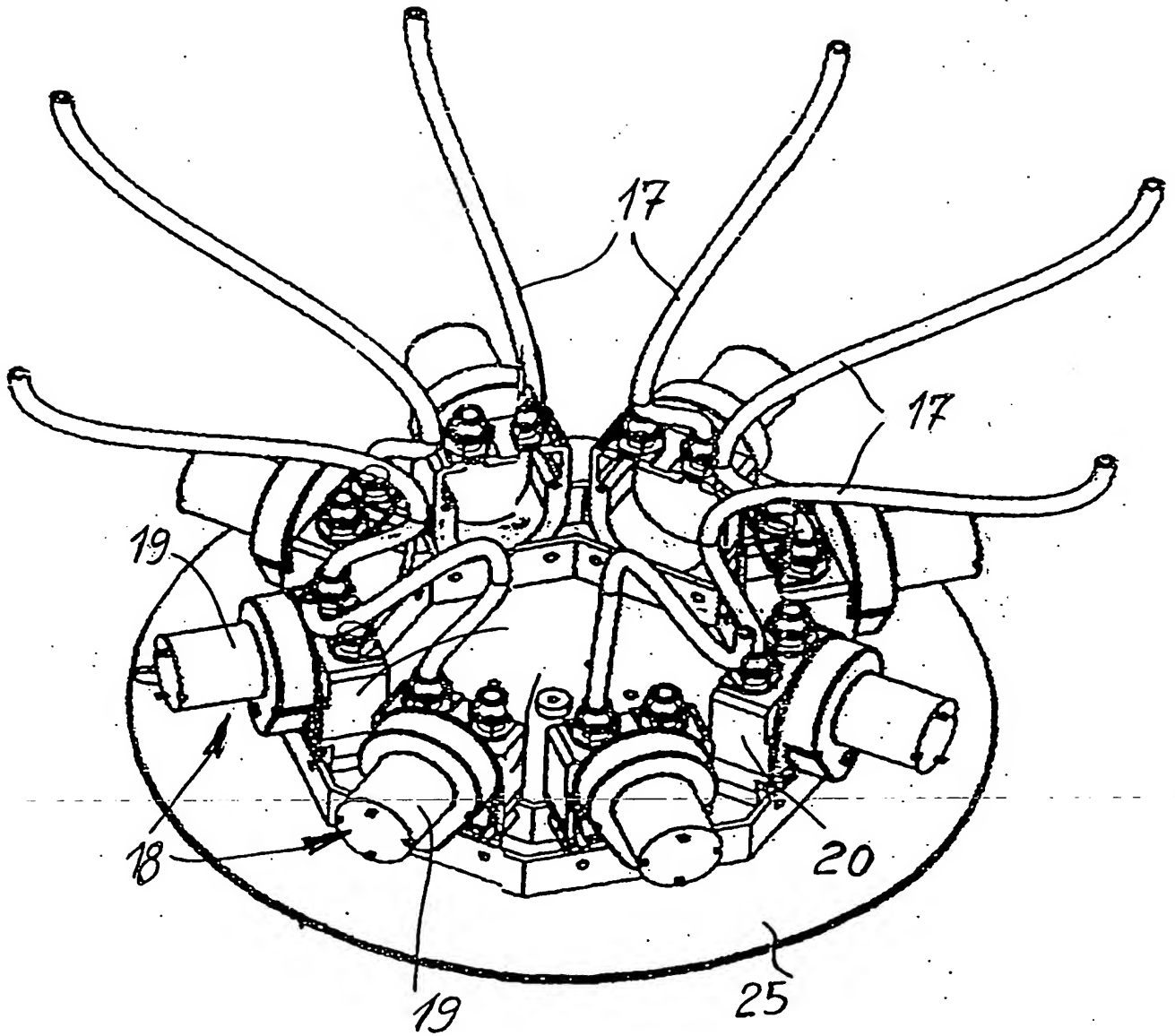


Fig. 3

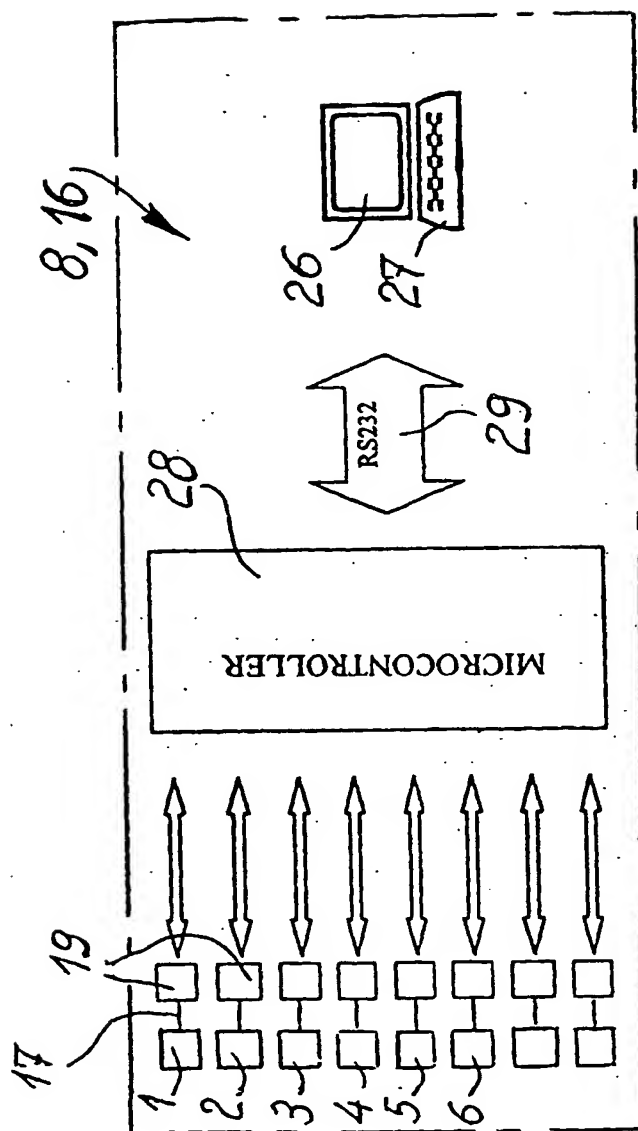


Fig. 4